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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/789,387

02/26/2004

Lei Shao

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INTEL/BSTZ

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EXAMINER

NGUYEN, LEON VIET Q

ART UNIT

PAPER NUMBER

2611

MAIL DATE

DELIVERY MODE

09/04/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/789,387	<b>Applicant(s)</b> SHAO ET AL.	
	<b>Examiner</b> LEON-VIET Q. NGUYEN	<b>Art Unit</b> 2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 17 June 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1 and 23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>6/23/08</u> .   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Response to Arguments***

1. This office action is in response to communication filed on 6/17/08. Claims 1 and 23 are pending on this application.
2. Applicant's arguments, see Remarks, filed 6/17/08, with respect to the rejection(s) of claim(s) 1 and 23 under 35 USC 102(b) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Boariu et al (US6865237) and Tirkkonen et al ("Minimal Non-Orthogonality rate 1 Space-time block code for 3+ Tx Antennas", Spread Spectrum Techniques and Applications, 2000 IEEE Sixth International Symposium on, Publication Date: 2000, Volume: 2, On page(s): 429-432 vol.2).

### ***Information Disclosure Statement***

1. The information disclosure statement (IDS) submitted on 6/23/08 was filed after the mailing date of 6/23/08. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

**4. Claim 1 rejected under 35 U.S.C. 102(e) as being anticipated by Boariu et al (US6865237).**

Re claim 1, Boariu discloses receiving content for transmission (receiver 302 in fig. 3) from a plurality of three or more transmit antennae (antennas 314, 316, and 318 in fig. 3); and

generating a rate-one (col. 12 lines 51-53), space-frequency code matrix (col. 12 lines 38-50) from the received content for transmission via the plurality of three or more transmit antennae (antennas 314, 316, and 318 in fig. 3).

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**2. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Boariu et al (US6865237) in view of Tirkkonen et al ("Minimal Non-Orthogonality rate 1 Space-time block code for 3+ Tx Antennas", Spread Spectrum Techniques and Applications, 2000 IEEE Sixth International Symposium on, Publication Date: 2000, Volume: 2, On page(s): 429-432 vol.2).**

Re claim 23, Boariu fails to teach a method wherein the plurality of three or more transmit antennae provide full space-frequency diversity of  $M*N*L$ , where M is number of transmit antenna, N is number of receiver antenna, L is order of frequency selective channel.

However Tirkkonen teaches a method wherein the plurality of three or more transmit antennae provide full space-frequency diversity of  $M*N*L$  (table 1, layered 4x4), where M is number of transmit antenna (4 transmit antennas), N is number of receiver antenna (1 receive antenna), L is order of frequency selective channel (Diversity 4). Although the method of Tirkkonen pertain to space-time codes, the method of Boariu also uses space time codes and teaches that it is obvious to use space-frequency coding in place of space-time coding (col. 12 lines 29-31 and lines 44-49 of Boariu).

Therefore taking the combined teachings of Boariu and Tirkkonen as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the step of Tirkkonen into the method of Boariu. The motivation to combine Tirkkonen and Boariu would be minimize the non-onhonormality that arises

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from increasing the rate above the maximum allowed by orthogonality (abstract of Tirkkonen).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leon-Viet Q. Nguyen whose telephone number is 571-270-1185. The examiner can normally be reached on monday-friday, alternate friday off, 7:30AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David C. Payne can be reached on 571-272-3024. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Leon-Viet Nguyen/

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Assistant Examiner Art Unit 2611

/David C. Payne/

Supervisory Patent Examiner, Art Unit 2611